

WHAT IS CLAIMED:

1. A laminate coil for an integral n -phase motor (n is a natural number of 2 or more) having pluralities of coil poles formed by patterned conductor coils formed in a laminate constituted by pluralities of insulating layers, said
5 laminate coil comprising input and output terminals formed on an outer surface of said laminate, a first connecting line connecting said input terminal to said coil poles, and second connecting lines series-connecting coil poles having the same polarity, said first and second connecting lines being formed by conductor patterns, and said coil poles being formed on pluralities of
10 insulating layers sandwiched by said first and second connecting lines.
2. The laminate coil according to claim 1, wherein the number of said coil poles is an integral multiple of n and equal in each phase.
3. The laminate coil according to claim 1 or 2, wherein n is 2 or 3.
4. The laminate coil according to any one of claims 1 to 3, wherein it
15 comprises a through-hole for receiving a rotation shaft and/or a bearing of a brushless motor substantially in a center portion of said laminate.
5. The laminate coil according to claim 4, wherein said first connecting line comprises an annular conductor portion surrounding said through-hole, a first conductor portion connecting said annular conductor portion to said input
20 terminal, and second conductor portions extending from said annular conductor portion and connected to said coil poles.
6. The laminate coil according to any one of claims 1 to 5, wherein said input and output terminals and said first connecting line are formed on one main surface of said laminate.
- 25 7. The laminate coil according to any one of claims 1 to 6, wherein each of said second connecting lines comprises two arcuate portions having different radii, and a radial portion connecting said two arcuate portions.
8. A laminate coil for an integral three-phase motor comprising

- pluralities of coil poles formed by patterned conductor coils in a laminate constituted by pluralities of insulating layers, said laminate being formed in the shape of a flat rectangular plate, and each of one input terminal and three output terminals being formed at four different corners on the same main surface of said laminate.
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9. The laminate coil according to any one of claims 1 to 8, wherein said coil poles are constituted by connecting coils formed on pluralities of insulating layers such that they overlap in a lamination direction, said coil being constituted by at least a first coil wound clockwise from inside to outside and a second coil wound clockwise from outside to inside, said first and second coils being connected via through-holes formed in said laminate, whereby said first and second coils have the same winding direction.
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10. The laminate coil according to any one of claims 1 to 9, wherein different-phase coil poles are arranged around a motor shaft at an equal angular interval.
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11. The laminate coil according to claim 10, wherein coil poles having the same polarity are arranged at rotationally symmetric positions of 180° around a rotation center of said motor shaft.
12. The laminate coil according to any one of claims 1 to 11, wherein said coils are fan-shaped spiral coils each having an open angle of 55° or less with said motor shaft as a center.
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13. A brushless motor comprising the laminate coil recited in any one of claims 1 to 12 as a stator, said laminate coil being arranged such that it opposes a rotor comprising a permanent magnet having different magnetic poles alternately via a magnetic gap.
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14. The brushless motor according to claim 13, further comprising an electric signal controller for periodically supplying electric current to each of different-phase coil poles of said laminate coil.